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AUTHOR Rosenfeld, Stuart
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ABSTRACT

This paper notes that vocational education has been associated with economic growth since the turn of the century, when such growth was used as a justification for the funding of early vocational training. Today, vocational education's contributions to economic growth include efforts such as employer demand research, dislocated worker programs, strategies for school/business linkages, and entrepreneurship education. Following a short history and rationale for the connection between vocational education and economic growth, this paper (1) describes a variety of connections between vocational education and economic growth and their underlying theoretical foundations, (2) notes the historical context in which the connections were shaped, (3) lists policy initiatives that were stimulated by the various connections, and (4) suggests future vocational education policy issues to be resolved in order to maximize the effects of vocational education on economic growth. Throughout the paper, the ways in which vocational education supports growth are divided into four types that reflect different periods in the nation's economic history: traditional, locational, emerging, and potential. The discussion is restricted to vocational education provided by the public sector, on which public policy can have a direct effect. Questions and answers on school-business cooperation, entrepreneurship education, and skill training in relation to economic growth follow the presentation. (KC)

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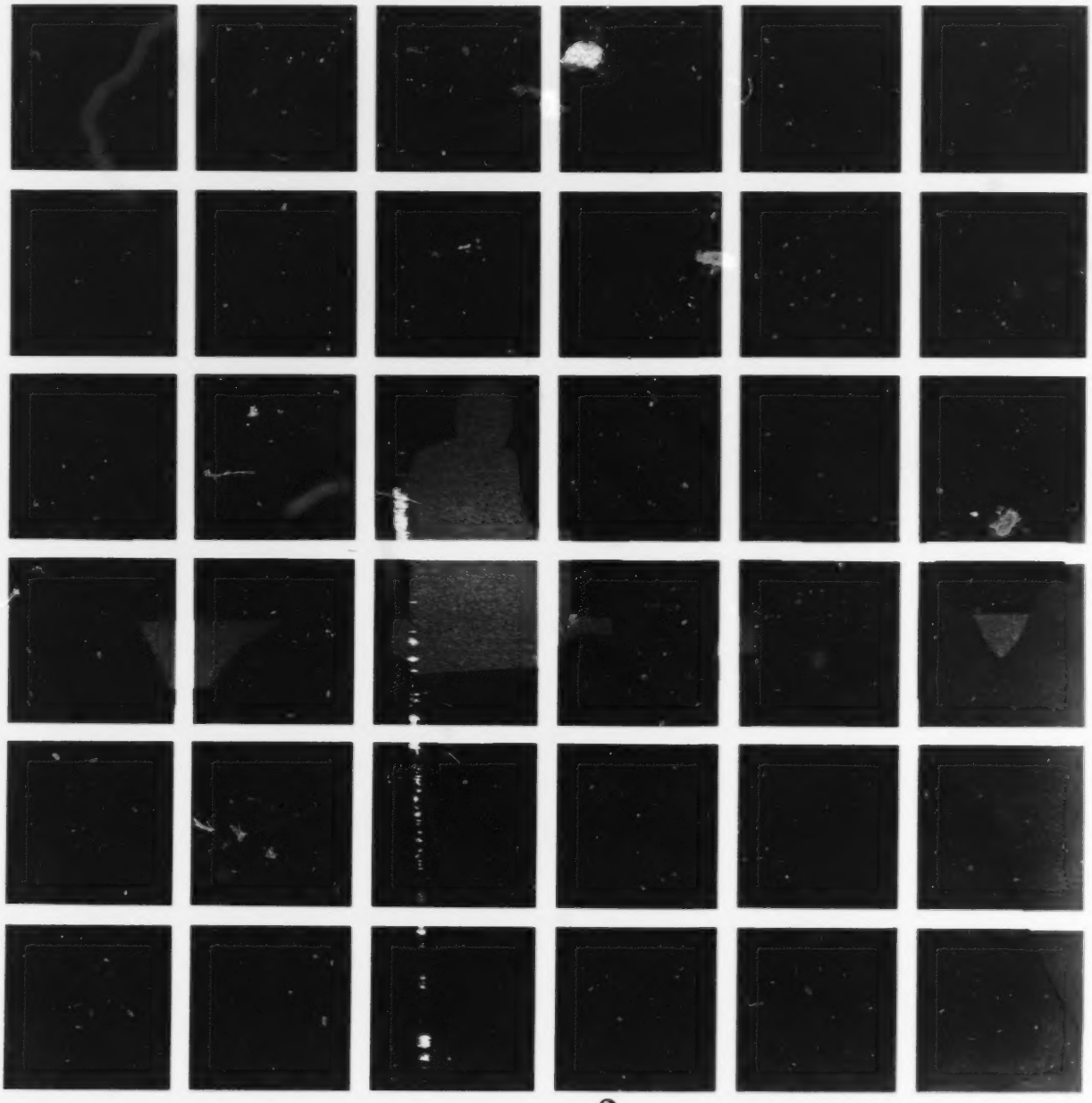

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For further information contact:

Program Information Office
National Center for Research
in Vocational Education
The Ohio State University
1960 Kenny Road
Columbus, Ohio 43210-1090

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Occasional Paper No. 112

VOCATIONAL EDUCATION AND ECONOMIC GROWTH
CONNECTIONS AND CONUNDRUMS

Stuart Rosenfeld
Director of Research and Programs
Southern Policies Growth Board
Research Triangle Park
North Carolina

The National Center for Research in Vocational Education
The Ohio State University
1960 Kenny Road
Columbus, Ohio 43210-1090

1986

FOREWORD

The topic of this National Center staff development seminar is "Vocational Education and Economic Growth." If I were asked to identify national problems that have become priorities for vocational education in recent years, I would choose equity, excellence, and economic growth.

Broadly defined, economic development activities are designed to attract new business and industry and to retain and expand current business. Vocational education's contributions to economic growth, then, include such National Center efforts as employer demand research, dislocated worker programs, strategies for school/business linkages, and entrepreneurship education.

Stuart Rosenfeld received a bachelor of science degree in chemical engineering from the University of Wisconsin, and a master of science in education from the same university. He also earned a doctor of education degree in Administration, Planning and Social Policy from Harvard. His work history reflects a fascinating diversity. Dr. Rosenfeld worked as a manufacturing engineer and also as education director for General Electric, and was president of the CompuDial Corporation in Milwaukee. Later he was director of the New School in Plainfield, Vermont, worked as a consultant at the Center for Education Policy Research, was a senior associate at the National Institute of Education (NIE) for 5 years, and since 1982, has been director of research and programs at the Southern Policies Growth Board at the Research Triangle Park in North Carolina.

Among Dr. Rosenfeld's many professional activities, some of his work in policy research is of special interest. He has designed and managed policy studies on such subjects as educational finance, rural education, declining enrollments, human resource development, technology transfer, rural development, and regional industrial policies, among others.

On behalf of The Ohio State University and the National Center for Research in Vocational Education, I am pleased to present this seminar paper by Dr. Stuart Rosenfeld.

Robert E. Taylor
Executive Director
The National Center for Research
in Vocational Education

VOCATIONAL EDUCATION AND ECONOMIC GROWTH
CONNECTIONS AND CONUNDRUMS

No objective is more strongly identified with the education reform movement of the 1980s than economic growth. Each of the reports that elevated education into the national spotlight links the quality of the nation's education system to the future strength of the economy. The Education Commission of the States says it boldly in the title of its study team, Task Force on Education for Economic Growth.[1] The National Commission on Excellence in Education used the linkage as a challenge to stimulate action in *A Nation at Risk*: "Our once unchallenged preeminence in commerce, industry, science and technological innovation is being overtaken by competitors throughout the world."[2] The Twentieth Century Fund states matter-of-factly that "they (the public schools) should ensure the availability of large numbers of skilled and capable individuals without whom we cannot sustain a complex and competitive society."[3] Each report, whatever its aims or perspective, emphasizes the importance of education to economic growth.

Although the notion that improving the quality and quantity of education is related to the growth of the economy may have been a revelation to some people in the 1980s, it did not come as a surprise to the vocational education community. Economic growth has been a basic goal and an expected outcome of vocational education for three-quarters of a century, a goal that was first explicated in detail at the turn of the century to sell the nation on the ideal of federal support for vocational education. The current ground swell of public and private support for nonvocational education for similar economic goals and the new "conventional wisdom" that education is an investment rather than an expenditure are in part a consequence of vocational education's long and happy marriage to economic growth.

Despite the fact that education has been accepted as an economic factor for some time now, there has been surprisingly little research on the nature of the relationship and little documentation of the impact of education on growth. Education is an investment with a long-term payoff and there is a dire need to continue to invest in it, yet there is little evidence on which to base estimates of returns on those investments. In the past, proof of the economic value of education has been left to economists, who plugged the most elementary measures of "education," such as years of formal schooling, into their production functions, called them "human capital"; and presented the mathematical results to their peers at professional meetings. This research has not been very helpful to education policymakers, however, because it usually fails to make important distinctions, for instance, between the effects of vocational education and nonvocational education, between "good" programs and "bad" programs, or between relatively large expenditures and relatively small expenditures on education.

More important, most of the research concerning the impact of vocational education on economic growth is limited to gains in productivity, as measured by increases in individuals' incomes. Economic outcome studies of vocational education measure effects on individuals, not on local economies or on the nation's economy. This work argues that there are many other, equally important, economic links between vocational education and economic growth that cannot be reduced to econometric models. Moreover, even though these links are not always recognized and thus not utilized effectively, they are intrinsic to vocational education.

The remainder of this publication (1) describes a variety of connections between vocational education and economic growth and their underlying theoretical foundations, (2) notes the historical context in which the connections were shaped, (3) lists policy initiatives that were stimulated by the various connections, and (4) suggests future vocational education policy issues to be resolved in order to maximize the effects of vocational education on economic growth. The discussion will be restricted to vocational education provided by the public sector, on which public policy can have a direct effect.

For purposes of discussion, the ways in which vocational education supports growth are divided into four types that reflect different periods in the nation's economic history: traditional, locational, emerging, and potential. Each type of connection has been in response to a specific set of social and economic circumstances, and therefore each has led to a different set of policy initiatives. "Traditional" connections, the earliest and still most widely accepted economic goals of education, are (1) to provide the nation with a labor force and (2) to increase productivity by improving individuals' skills and work habits. "Locational" connections include (1) improving the local and regional infrastructure necessary to support net growth, (2) demonstrating a "good" economic climate to business, and (3) supporting the training needs of local employers. "Emerging" connections are (1) increasing productivity through the innovativeness and decision-making ability of workers and (2) stimulating entrepreneurship. Then there are "potential" connections that are not fully recognized or realized: vocational education as (1) a means to create business directly and (2) an industry that consumes goods and services and provides employment.

Traditional Connections

Social, Political, and Economic Context

Throughout most of the history of vocational education (1905-55), the force driving labor market demand was industrialization. During the early part of the period (1905-20), the demand for American goods grew rapidly, creating a large number of jobs in new and expanding industries. But even though the urban labor force swelled with new immigrants and rural in-migrants, it could not meet the demand for workers with the requisite skills and work habits. In 1902, according to the National Association of Manufacturers (NAM), a contracting company in New York City had to import 4,900 skilled mechanics from Europe, at 50 cents per day above union rates, because skilled workers could not be found locally.[4]

As a result the nation, despite a tremendous stock of natural resources, was unable to compete successfully with European-made finished products. The blame—and the challenge—rested with education. In 1905, NAM's Committee on Industrial Education exhorted the nation to support industrial education. "We should act at once because of the stress of foreign competition. . . . As every manufacturing establishment must have first-class mechanical equipment and management, so also it must have in its workmen still equal to those of its competitors."[5] The National Education Association was told by a prominent banker that the secret of Germany's commercial success was that it adjusted its schooling to meet manufacturing requirements. "From the economic point of view, the school system of Germany stands unparalleled."[6]

Congressional debates over support for vocational education repeatedly pointed to Germany's specialized vocational education as the model this country should emulate. In 1912, the Senate was told that "the nations of the earth are now engaged in a race for commercial supremacy, and in that race today Germany is confessedly taking the lead. . . . This is in large measure, owing to the fact that she is more progressive in the matter of industrial education than any other nation in

the world."[7] (This struggle for worldwide commercial supremacy, noted repeatedly in the *Congressional Record*, was reinvoked in *A Nation at Risk* for similar reasons—to urge increased investment in education for economic purposes.)

Hypotheses: Productivity and Labor Supply

There were two assumptions about how vocational education was related to economic growth that molded policy during the early period of vocational education (which began with the Smith-Hughes Act of 1917 and lasted until midcentury). The first concerned quality of labor—that a more educated and highly skilled work force would lead to greater efficiency and higher overall productivity. The second related to quantity of labor—that vocational education could more effectively meet labor demand and supply a work force capable of meeting the needs of expanding urban industrialization. Each assumption implied the need for vocational education to meet the needs of, and promote, economic growth.

Policy Development

Growing acknowledgment that the skills and knowledge of the work force represent human capital, part of the stock of capital that produces wealth, led to sizable increases in public and private investments in vocational education. The Commission on National Aid to Vocational Education in 1914 argued that "in the last analysis expenditure of money for vocational education is a wise business investment which will yield large returns, not only in education and social betterment but in money itself, than a similar amount spent for almost any other purpose."[8]

As the economic goals of vocational education gained higher priority, the legitimacy of vocationalism in public education was more broadly accepted, and support in the Congress emerged. Economic arguments for federal support for vocational education were prominent in the congressional debates. For example, Senator Page of Vermont deplored the fact that the nation was exporting raw materials but importing finished, high value added products. He noted in his statement to the Senate, "the extent to which we change our conditions by increasing the efficiency of our boys in vocational education will measure our success in our industrial struggle for commercial supremacy in the next decade . . . [and] by using that efficiency which comes from a better and more practical education, we can outdistance the world."[9]

Although some consensus developed concerning the economic outcomes of education, the form it should take in the schools was hotly debated, and federal support for vocational education in the schools did not come to pass without considerable conflict over how vocational education fit into the existing education system. Charles Prosser, secretary of the National Society for the Promotion of Industrial Education (NSPIE), argued for a vocational education curriculum distinguished from the academic curriculum to prevent confusion with or dilution by too much classical education. David Snedden, another prominent education leader, also advocated separate vocational education, although he favored some balance of cultural education; he preferred that federal funds be directed to serve adults between the ages of 20 and 30, not youth. Both Snedden and Prosser wanted vocational education to "divest itself as completely as possible of the academic atmosphere" and reproduce the "atmosphere of economic endeavor."[10] Their favorite scenario was part-time schools combined with work—which is what the Federal Board of Vocational Education advocated until the 1930s.[11]

John Dewey, a highly respected educator and the protagonist in the debates, agreed with both that vocationalism was important, but believed that productivity would best be achieved by integrating vocational and academic curricula. More important, though, he was appalled at the social and economic implications of a dual system of education. In contrast to the others, he believed that vocational education should be an instrument for transforming the existing industrial order of society to a more enlightened and democratic order.[12]

None of these education leaders questioned the implications of vocational education for economic growth. They differed in their views of what vocational education should be expected to accomplish: whether it ought to respond to the needs of industry or drive changes in industry. Each person's position was motivated by the belief that vocational education was linked directly to the state of the economy and the wealth of the populace.

Policy Directions: Expansion and Employment

Public discussions of the economic functions of vocational education and the ensuing struggles to decide just how public education ought to be shaped to fit the new industrial economy led to some basic changes in education policy. First, the federal government was brought into the picture and the states' roles strengthened. With the exception of the land grants for universities and small state grants to school districts, the responsibility for providing education had been left entirely to local communities. Any policies that interfered with local control of schools met fierce resistance; despite increasing state responsibility for education, there were few state rules and regulations compared to today. The average number of staff members in state departments of education in the early years of this century was only two. Once it was established that education was an economic investment, however, vocational education took on a broader national purpose and it was easier to justify a state presence. And the "interstate character of industry and the national character of state business and industrial life" combined with "extreme mobility of labor" justified federal involvement.[13]

Second, the economic goals resulted in an alternative to the classical curriculum that more directly addressed those goals: vocational education was introduced as a parallel track within the public high school. It both extended the education of students not preparing for professional careers and gave it a distinct identity. Even though it was aimed at nonprofessional occupations, it was at first intended to confer a certain status on its participants. It was not—according to many of its proponents—intended for new immigrants from eastern and southern Europe. Nor was it intended for the blacks in the South. "Neither federal government, state government, nor private philanthropy would foot the bill for well-developed black mechanical and technical schools."[14]

Vocational education was designed initially to prepare people for supervisory positions such as foreman or for skilled occupations. According to the National Commission on Aid to Vocational Education, it was "to better fit them [students] to progress in industry and enable them to rise to ranks of leadership and responsibility."[15] But priorities were reordered by political and business leaders who knew that there was still a demand for low-wage, unskilled labor and feared that providing vocational education to this segment of the labor force would simply raise expectations and generate competition with the middle classes. The expansion of high school education stimulated by vocational education had a dual effect on growth—it improved the value of human capital but it also delayed entry of youth into the labor market, reducing the size of the labor force. In time, vocational education lost the more egalitarian goals of preparing youth for advancement and became, more narrowly,trade education.[16] When that happened, vocational education became a program that disproportionately served youth from lower class homes.

Third, traditional economic goals introduced a new set of actors from the private sector, providing a rationale for their deeper involvement in education policy. The vocational education legislation probably would not have passed without strong support from NAM, NSPIE, and the American Federation of Labor (AFL). Each stood solidly behind federal support for vocational education because each saw economic benefits in the program—even though they had different political perspectives and different visions of the program's purpose. Business groups were eager to have the government assume some of their training costs, and the unions wanted some influence on how schools would affect work opportunities.

Fourth, and perhaps most important, the traditional economic connections established employment and employability as legitimate goals of public education. Even though the idea of human capital development had already been accepted, it was considered to be an available and desired outcome, not an intentional goal of education. The fact that educated people were more likely to be promoted or more productive was a by-product of a process created for other purposes, not an explicit objective. These goals finally were fully addressed specifically in policy after 1963, when new federal legislation eliminated the funding of specific occupational areas and gave block grants to the states. These grants were to be used to fund programs planned to meet labor market demand and to be evaluated in terms of the employment of completers.

Locational Connections

The Context

In the 1950s and 1960s, two new sets of conditions both expanded and altered vocational education's role in economic growth. The first was growing concern over disparities in patterns of growth and wealth. As the nation shifted its economic base from agriculture to manufacturing, employment and wealth became more concentrated and more unevenly distributed, not only among individuals but among regions and localities. The civil rights movement, probably more than any other single event, made the public take notice of the nation's poverty in the midst of national wealth. Certain parts of the nation—particularly areas that were very rural or with high concentrations of blacks—were left behind in economic growth. Policymakers identified lack of education and skills as the root cause of inequality and therefore turned to education and training as a solution.

The second condition was more intensified competition for jobs within the nation (between regions and between states) through competition for branch plants. Beginning in the early 1960s, industrial recruiters, particularly in the South, began shopping around for companies dissatisfied with their existing labor conditions, taxes, or wage rates. Economic development became a highly competitive activity. Though this competition did not necessarily add to the nation's net aggregate economic growth, it strongly affected state and local economies.

Hypotheses: Infrastructure and Business Climate

Increased competition and growing economic disparities led to two new and related hypotheses about vocational education and economic growth. The first is based on the notion that there are specific and identifiable resources in a community that encourage and nourish growth, and that vocational education is one of the resources. As such, it is a contributing factor in decisions regarding business start-ups and expansions. Vocational education, in this role, is part of the local infrastructure. The Committee on Vocational Education convened by the National Academy of

Sciences interpreted vocational education as a form of infrastructure for economic development as "the capacity of the program to meet or adapt to specific needs of employers, not the number of students trained or the pool created, that has the potential to attract jobs."[17] This new idea of vocational education as infrastructure was appended to the traditional notion that vocational education facilities and programs improve the level of skills in the local work force, crediting vocational education with a much stronger role in economic growth.

The other new hypothesis is based on the notion that there are certain conditions in a community, sometimes referred to as a "business climate," that foster growth. This hypothesis leads to policies in which the public sector finds ways to meet the needs of private enterprise in order to put itself in a better competitive position to "acquire" new jobs. Designing vocational education programs expressly to support local business is one way that a community demonstrates a good business climate. This, in a sense, systematizes the "plant training" that some vocational education programs have been offering since the 1930s, but greatly expands the scope and scale so that an entire work force can be trained for a particular company at the expense of the state.

Policy Development

The notion that vocational education might help reduce poverty first came not from educators, but from economic development officials. There were two ways vocational education was expected to improve economic conditions: (1) by improving the level of skills in the labor force in depressed areas, both improving individuals' employment opportunities and also making the site more desirable to business; and (2) by being an important element in the local infrastructure that would guarantee a continuing labor supply and provide retraining for modern industrialization. This, according to development experts, would certainly influence the location and expansion of businesses.

In the 1960s, Congress created an array of new programs to provide resources to depressed communities in order to create an appropriate infrastructure, including schools and training facilities, to support industrial growth.[18] Beginning with the Area Redevelopment Act of 1962 and the Trade Adjustment Act of 1968 and continuing with the Appalachian Regional Development Act of 1965, the federal government poured hundreds of millions of dollars into new vocational education facilities and programs in depressed areas of the country to stimulate growth. The Appalachian Regional Commission (ARC) and Economic Development Administration (EDA) alone invested $687 million that can be traced directly to vocational education.[19] Vocational education policy, as part of this plan, took on both explicit and implicit redistributional economic goals.

Federal vocational education policy incorporated many of these redistributional goals aimed at selected local growth, finally explicitly linking vocational education to economic growth policy. The Vocational Education Act of 1963, which significantly increased federal expenditures, refers to the Area Redevelopment Act and specifies that one-third of all funds until 1968 be used to construct area vocational centers; other funds were authorized to provide training to those persons covered by the Area Redevelopment Act and the Trade Adjustment Act. In 1976, the Amendments to the Vocational Education Act of 1963 required that funds be distributed with preference given to depressed areas or areas of high unemployment. (By 1976, however, the definition of a depressed area was so broad that well over four-fifths of the nation's population qualified, making the factor meaningless.)

The idea that vocational education that supports specific companies' training needs improves the business climate established vocational education as part of a growing package of incentives

that states and communities offered to prospective businesses to expand or relocate there. Vocational education programs that screen and pretrain a work force to smooth the start-ups of new, expanding, or relocating businesses are promised to company officials to impress upon them the kind of support they could expect from local and state government.[20] These programs originated in the Carolinas and were quickly picked up by other southern states. In South Carolina, for example, officials reported that their customized vocational education and technical institutes played a role in attracting $10 billion in new capital investment to the state between 1973 and 1979.[21] About 5 years ago, the Northeast-Midwest Institute recommended that all their member states emulate this model, and now it is nationwide.

In addition to recruitment and training, vocational educators and schools began to provide technical assistance to businesses, including running short-term courses for management. In South Carolina, one technical institute offers courses such as Management by Objectives and Supervising for Results. In this context, with vocational education expanding its role to provide and promise a broad range of services to business, the program and facilities are part of the infrastructure and the customized training is part of what is considered a "good" business climate. This concept was expressed concisely by New Jersey's Governor Brendan Byrnes in a *New York Times* advertisement in 1974: "Profit from free, customized training of your own work force. . . . We'll survey your needs, plan the training, secure the funds and facilitate, screen, and recruit workers—and train the workers precisely to your needs."[22]

Vocational education designed to meet the particular needs of specific companies currently is viewed as the most direct, most demonstrable, and most successful way that vocational education leads to economic growth. A report prepared by the American Vocational Association for the U.S. Department of Education on the role of vocational education in economic development concentrated on customized training programs as incentives for public sector investment. It even led to a handbook being prepared for local industrial development officials and educators that defined, in detail, vocational education's role in recruiting businesses and creating a environment conducive to growth and expansion.[23]

As competition between states increased, more and more states added "customized training" to their public education policies. As a result, the availability of customized vocational education may be the deciding factor in a company's decision to expand. But local development officials are less able to use the availability of this program to influence location decisions as it becomes more widespread. What once was an important incentive to "win" new jobs has become simply a requirement to play the game—public service expected from state education agencies. Even under these new rules of the game, however, proponents argue that customized training remains important as a factor in expansion decisions, and that it reduces the marginal costs of a business expansion enough to tip the balance in favor of some investments.

Policy Directions: Adults, Area Centers, and Incentives

The locational functions of vocational education have increased the economic functions of vocational education by adding responsibilities to improve economic opportunities of disadvantaged individuals and communities and to influence business location or expansion decisions to the list of goals of such programs. These added goals led vocational education in a number of new policy directions.

First, the idea of vocational education as part of a community's infrastructure led to large-scale federal, state, and local investments in "bricks and mortar" and a proliferation of area vocational centers, particularly in nonmetropolitan areas. Modern vocational facilities became a symbol

of a vocationally oriented education system. One result, though, was a further separation of vocational education students from academic students and a shift in emphasis in vocational education even more away from education and toward training.

Second, the policy arena of vocational education was expanded to include economic development agencies and organizations. At the federal level, this includes the ARC, the EDA, and the Tennessee Valley Authority (TVA), all of which have targeted funds for vocational education. In the ARC program, in fact, vocational education has been the second largest expenditure over the years, second only to roads. Even in 1983, after the funds for vocational education had been nearly eliminated, job training, including vocational education, was the main theme of the ARC annual meeting.

Third, locational connections strengthened public-private partnerships. Although private sector interest was strong in the early part of the century, it waned as programs seemed more removed from immediate labor market needs. But when vocational education paid more attention to the training needs of businesses beginning in the 1960s, support grew stronger once again. The resources of industry and the resources of vocational education were systematically linked, with educators depending on industry for materials, equipment, and sometimes instructors from the private sector and business depending on education for dependable, productive employees, technical assistance, and management education. Today, the private sector is a powerful lobbyist for vocational education legislation. As a recent study on vocational education and economic development in Arkansas concluded, "industry has a vested interest in vo-tech education because the creation of a skilled labor pool would cut its training costs, reduce the need for importing expensive supplies, and facilitate replacement and addition of workers."[24]

Fourth, the definition of vocational education was adjusted to include adults who were in short-term programs that did not lead to any degree. Previously, these courses were considered purely as training, not part of vocational education. The inclusion of short-term programs contributed to large increases in enrollments in vocational education in the 1970s; in 1979-80, the last time the federal government kept separate enrollment figures for short-term adult training programs, 22 percent of the 17 million people enrolled in vocational education were in such programs.

Fifth, the new linkages shifted the balance of priorities of vocational education from serving the individual to serving community or business. As a result, new measures of effectiveness began to be considered, such as new jobs created or local income generated.

Emerging Connections

Social, Political, and Economic Context

During the past decade, three new social and economic developments added still other dimensions to the connections between vocational education and economic growth. Science and technology took a quantum leap in importance in the late 1950s with the advent of the space age and with forecasts of rapidly increasing factory automation. That priority dropped in importance temporarily in the late 1960s and early 1970s, when public desire to get out of Vietnam overshadowed the public interest in getting into space, and when it became evident that automation was not going to eliminate the blue-collar worker to the extent predicted. However, technology again became a catalyst for growth in the 1980s. Intensified technological competition from Japan and European countries drove industry to become more productive, and technology and innovation were believed to be the keys to higher productivity. Second, different styles of management in

competitor nations demonstrated that innovation can come from the shop floor as well as the research labs or managers' offices. A growing number of economists are coming to the conclusion that productivity is more a function of the job than of the individual, and that a business organized to utilize the skills, knowledge, and experience of all its employees has more ways to improve productivity.

The third condition that has created new roles for vocational education in economic growth is the evidence uncovered by David Birch of Massachusetts Institute of Technology, and then heavily publicized, that small businesses have made a substantial and disproportionately large contribution to new job growth. The publicity accorded Birch's research has raised the status and stature of the "entrepreneur," the private business man or woman who has risked time and capital to create a successful enterprise. No matter that most fail. The few winners are portrayed by the media as celebrities, especially when the business is technology related. The ingredients of entrepreneurship are ideas, risk, venture capital, and management skills. Vocational education is increasingly accepting the responsibility for the last ingredient, the one that so often spells the difference between success and failure. Hence, entrepreneurship has been added to a growing list of goals in the latest vocational education legislation.

Hypotheses: Innovation and Entrepreneurship

The impact of science and technology both revised existing ideas about how to use vocational education to improve productivity and added a new theory about how vocational education can lead to economic growth. The emerging idea of how vocational education can improve productivity is really a new variation on the traditional connection. Traditionally, vocational education prepared workers to utilize and adapt to technological change in the workplace. The emerging view is that vocational education ought to impart the knowledge and attitudes that prepare graduates to be innovative and make decisions. It assumes that there are choices in how technology is used and that workers, in order to utilize their increased skill and knowledge to improve their productivity, must be given more latitude in making resource allocation decisions.[25] Vocational education that provides the knowledge and confidence that workers need to contribute directly to technological change by suggesting ideas to improve production processes or the quality of products contributes to raising productivity in different ways than if the workers simply manipulate technical equipment to perform work assignments more efficiently.

The other new assumption is that vocational education can impart the skills, knowledge, and attitudes needed to expand opportunities to include self-employment; and that entrepreneurship is something that can be taught and encouraged in the proper educational environment. This has been supported in theory but not in practice, and most attempts at entrepreneurship (outside of agriculture) have been limited to selling something produced as a class project or adding a module on "free enterprise" to the curriculum.

Both of these hypotheses were highlighted in a recent international report on the future of vocational education in industrialized nations. Strengthening the economic and social goals of vocational education and training, the report suggested, should be "done through specific practical measures to facilitate innovation; the development of technology; the creation of viable new firms; growth of productivity."[26]

Policy Development

The idea that vocational education can lead to growth by utilizing technology more efficiently, considered by most to be relatively new and emerging and the one idea most likely to be important to future growth, is in reality the oldest. It is deeply rooted in the history of that alter ego of industrial education, vocational agriculture.

The study of science and the use of scientific methods have been integral parts of the vocational agriculture curriculum, preceding even the Smith-Hughes Act. The advance of technology and innovation in agriculture was recognized in the debates in Congress as one of the reasons to support vocational education. "Science has touched farm life as with a magic wand, and it has blossomed beneath its potent touch," according to Senator Towner of Iowa. He continued, "This demands knowledge, education, vocational training. . . . The boy's and girls' clubs (precursors of FFA and FHA) have shown what a combination of scientific knowledge with youthful enthusiasm can accomplish."[27]

Vocational agriculture was introduced as part of a comprehensive plan to utilize science and technology to modernize what was then the dominant economic sector of the economy and to increase its productivity. The Hatch Act of 1887 created agriculture experiment stations in the universities, setting the stage for scientific farming; the Smith-Lever Act of 1914 established a network to provide technical assistance to demonstrate new methods to farmers; and the Smith-Hughes Act of 1917 firmly established vocational agriculture in the high schools to reach those most likely to be receptive to new ideas—rural youth—and to influence parents resistant to change.

It was not until the late 1950s, after the shock of Sputnik and after predictions of rapid automation of manufacturing, that the ability of the work force to respond to and support technology became important to the other vocational education programs. Whereas academic high schools and colleges revamped their curricula to improve and expand math and science programs, vocational education took on the task of ensuring a supply of trained technicians and support staff and of retraining those expected to be displaced by automation.

In 1958 the vocational education legislation (George-Barden Act of 1946) was amended by title VIII of the National Defense Education Act to provide "vocational and related technical training and retraining for youth, adults, and older persons designed to equip them for useful employment as technicians or skilled workers in the technical and scientific fields."[28] Then, in 1962, and in response to the threat of automation, the Manpower Development and Training Act (MDTA) was passed to retrain workers to adapt to technological change. Up until 1967, when MDTA was targeted to disadvantaged workers and turned more to community-based organizations and the private sector, two-thirds of the training was provided as vocational education in the public schools.

It was much later before vocational education programs other than vocational agriculture recognized the full potential for contributing to scientific progress and innovation. Until the recent publicity accorded Japanese management methods, which demonstrated how much more workers can contribute to productivity than just their labor, vocational educators did not give serious consideration to the effects of their programs on innovation. Although little is known about the most effective methods for imparting, through vocational education, the skills and attitudes that lead to innovation, it is increasingly apparent that the work habits valued for traditional manufacturing and service occupations and thus sought by educators are inefficient and sometimes even inappropriate. Order, dress, discipline, and punctuality are, of course, important to employers, but it is often the independent thinker, the tinkerer, or the risk taker who is the most creative, innovative and successful problem solver.

Entrepreneurship has always been part of the vocational agriculture curriculum. Most vocational agriculture students, unlike trade and industrial students, had been and still are prepared for self-employment. As future farmers, they need to understand risk taking, which every farmer must face under uncertain weather and market conditions. Four important ingredients of a strong entrepreneurial spirit are present in vocational agriculture: the inclusion of management and capital investment decision skills in the curriculum, a problem-solving pedogogy, a positive attitude toward taking financial risks, and leadership training (provided through the intracurricular activity, Future Farmers of America).[29]

The current initiatives for including entrepreneurship in vocational education curricula are coming from the Small Business Administration (SBA), operating in part through Small Business Development Centers. Although vocational agriculture has gone farthest toward promoting successful entrepreneurship in the high school, the community colleges have gone a step farther, combining entrepreneurial programs with technical assistance to small and potential businesses. The Ohio State University works through the state's network of technical institutes to provide assistance and training to small businesses in technology-related areas. In North Carolina, the community colleges recently opened 14 Small Business Development Centers to provide a centralized source for training, coordinated services, and information for small businesses and potential businesses. Between July 1, 1984, and February 15, 1985, the centers enrolled almost 5,000 in 219 course offerings.

Policy Directions: Specialization, Innovation, and Leadership

A number of major changes in vocational education policy have been set in motion by these new linkages between vocational education and growth. Exactly how they will be accepted by educators and how they will be implemented is not yet clear.

First, a change that has already taken place is a rapid expansion of postsecondary vocational education and technical institutes, accomplished by both reorienting existing community and junior colleges to include more technical programs of study and by constructing new technical institutes. Workers in science and technology fields are assumed to require more specialized education, but also a stronger theoretical base. That may explain why 94 percent of all students enrolled in the occupational area called "technical occupations" in 1981 were at the postsecondary level. The implication of this is that high school vocational education must, in many cases, be considered preparation for further vocational education in 1- or 2-year postsecondary programs.

Second, and more recent, there is renewed interest in vocational education as a way to impart basic skills needed for more technical work. This is evident in the language contained in the new Carl D. Perkins Vocational Education Act of 1984, which added "to improve the academic foundations of vocational education students and to aid in the application of newer technologies (including the use of computers)" to its statement of purpose. And it is a central feature of a recent reports by the National Academy of Science (NAS)[30] and the Committee on Economic Development (CED). "Before any student is allowed to complete occupationally specific training, he or she should be required to demonstrate achievement of an adequate level of academic competence."[31]

Third, there is a rediscovery of entrepreneurship and work on designing curricula to provide youth with the skills and attitudes associated with entrepreneurial activities. Thus far, however, there is more rhetoric than policy. Teaching entrepreneurship is still generally viewed as making a minor adjustment to existing curricula, which can be taught in a "module," rather than as an

attitude toward employment and a particular set of needed skills. Those arguing against entrepreneurial programs believe that it is naive to expect youth to have the ability and capital to become entrepreneurs immediately, and that if they do not begin new businesses immediately, they will not meet the "success" criterion of the program. Since many employers value entrepreneurial skills (demonstrated by the employability of vocational agriculture graduates), the barrier seems to be the evaluation criterion.

Fourth, workers are helped to adapt to technological change by extending the retraining function of vocational education. It is no longer viewed only as entry-level training; since the 1960s, vocational education has been used as a retraining program. The recent recession and the ongoing restructuring of the economy have reinforced this role, requiring still another set-aside of federal funds. Although the explicit rationale is based on plant closings, the major underlying cause of displacement is technology.

New and Potential Connections

Recent and anticipated conditions point to potential connections that are as yet unaddressed by government policies. One potential connection is based on the role of vocational education in the ongoing transformation of the basis of the economy from the production of goods to the provision of services. The other potential connection is based on the expanding search for new ways to stimulate new business development. Although new information on the impact of small businesses on job growth drew attention to the emerging connections, it is more a new national perception of the entrepreneur, [not the multinational firm, as the key to future growth] that will generate the future connections. In this new context, vocational education is itself both a service industry and an entrepreneur.

There is nothing new about the fact that vocational education is a business. All the conditions that are accelerating structural changes in the economy increase the demand for education and training. In 1979-80, more than 400,000 people were employed directly in federally funded vocational education programs. Thus, vocational education is not only a factor that contributes to growth in other sectors but is also part of a growth industry itself. Alvin Toffler predicts "that we are about to go into the training and retraining business on a tremendous scale. . . . In fact, training, itself, can be a big employer as well as a gigantic customer."[32]

Dollars spent on vocational education are used not only to provide employment but also to purchase goods and services. Thus, there is a multiplier effect for education and training services, just as there is for manufacturing.

The other potential connection is based on the fact that vocational education can do more than just prepare people for employment: Vocational education can create new employment opportunities. For years vocational education has flirted with the notion of new business creation: a vocational agriculture program sells its agricultural products, a trade and industrial education program builds and sells a house, or a distributive education class operates the concessions at the football games. But these are considered "class projects," not businesses with growth and possible commercial spin-off potential. Their purpose is experiential learning for the individual, not new business for a community, and the learning generally is limited to the specific skills associated with a student's occupational program. There is no attempt to build a viable business enterprise that can expand, and there are no objectives beyond the school term.

Two existing models for new business development have been modified and adapted by vocational education: one is the new business incubator and the other is the community development corporation. These vocational education ventures are embodied in the new business incubators created in a small number of Oklahoma's rural area vocational centers and in the school-based enterprises under way in Georgia and North Carolina.

Three area vocational centers in depressed rural counties in southeastern Oklahoma are experimenting with vocational education for new business in "incubators," which are protected environments to try out new business ventures. In this model, the teaching of business skills and production skills is combined with technical assistance and help in locating capital.[33] An arrangement with the industrial technology research and development center at a nearby college helps direct potential products to the schools, and the vocational education instructors scour the towns for other marketable ideas. Oklahoma is the only place thus far that has made this connection between education and skills on the one hand, and technical assistance and incubating environment on the other.

This direct tie between vocational education and economic growth is taken even farther in the school-based enterprises, which are being introduced in North Carolina and Georgia through REAL Enterprises, Inc. In this model, whose origin was the merger of schooling with the Committee for Economic Development,[34] the school takes on the responsibility for planning, starting, and operating businesses. Vocational education is taught in a real work situation; students are given a broad range of entrepreneurial, management, and work skills; and new jobs are created. In Hartwell, Georgia, for instance, students working with the local development corporation and local vocational education instructors have renovated a store on Main Street, have taken over the Hartwell Railway Company and started a tourist excursion train, and are planning a community theatre. All are intended not simply as projects to be completed but as ongoing businesses that can and will be self-sustaining.[35] A similar, urban model is Entrepreneurial High School in Detroit, which taps the entrepreneurial skills of disadvantaged youth in the center city (as demonstrated by some success in the underground economy) and converts it to legitimate ends with vocational and academic education and training.

A Few Conundrums

The various connections between vocational education and economic growth imply enacting specific local, state, and federal policies and programs. Policies most effective for producing one type of connection, however, sometimes confict with policies most effective for producing another. Policymakers may face the problem of having to assign priorities to the form of growth desired and then choosing among policies. This is not an easy task, as the following illustrative examples demonstrate.

First, and possibly foremost in the public's eye, is that the time needed to acquire sound basic skills and that needed to become proficient in a specific occupation both have increased, whereas the total time spent in school has not. This increases competition between vocational and academic programs—which has been exacerbated by the education reforms that call for even more time on task for basic skills. This is leading educators to reevaluate the form of vocational education most appropriate for the comprehensive high school.

Second, and even more challenging, there are contradictions between skills and work habits needed to be innovative and effective in companies managed participatorily and those needed to work satisfactorily and dependably in traditionally managed businesses. The attitudes and work

habits historically evaluated and rewarded in vocational education, which are those that have been desired by manufacturing, are not the same as those most likely to lead to innovation. There is little evidence, for example, that independence and creativity are evaluated or valued by vocational educators. Even though new emerging management styles are more accepting of the nonconformist and more open to new ideas, old habits are difficult to break. To some extent, the school environment and the social relations within the school reflect and reinforce the traditional management styles of industry.[36] That environment, which has existed since the beginning of public schooling, is highly resistant to change.

Third, there is a conflict between operating a program in part for business financed by revenue derived mostly from state and local taxes, and keeping taxes low for businesses and even providing tax abatements to attract industry. Businesses can increase the demands on educational resources without contributing proportionately to the tax base needed to provide those resources. This creates a dilemma for local officials who want adequate resources for their schools but also believe that low taxes are the most important factor in good business climate.

Fourth, using vocational education as an incentive to improve employment opportunities in depressed areas or to train disadvantaged workers is in direct conflict with the use of vocational education as an incentive for business. Most businesses prefer workers likely to be most productive and least "risky," not those considered "at-risk." Even when federal programs compensate business or for higher training costs with subsidies for training and hiring, they are reluctant to hire those disadvantaged or handicapped workers who may need employment the most. And even with locational incentives, businesses are reluctant to locate in depressed areas—particularly where there are high concentrations of minorities.

Fifth, modernizing vocational education facilities and classrooms in order to stay current with the latest technologies and shifting industrial mix becomes increasingly difficult and costly as change accelerates. It leads to large expenditures of scarce resources to chase a moving target of state-of-the-art technology. Further, the decisions often must be based on occupational projects that have not proved reliable in the past for predicting new or emerging occupations.

Sixth, there is a contradiction between preparing an individual for a single occupation and data on individual occupational mobility. Between 1982 and 1983, more than one out of every nine workers between the ages of 25 and 39 changed occupations. A third of all women and a fourth of all men remain in their chosen occupation 3 years or less.[37]

Last, there are continuing conflicts over the goals of vocational education—whether economic goals ought to dominate policy or whether purely developmental and pedogogical goals should be primary. Despite the current high priority accorded economic goals, the classic debate between the pragmatist and the humanist still has not been resolved. Several of the reform reports recommend more classical notions of secondary education for all youth.

QUESTIONS AND ANSWERS

Stuart Rosenfeld

Question: Do you have any other ideas beyond incubators and school-based business experiments through which communities and vocational education can help economic development?

The school-based enterprise is meant to be a generic activity, a way of getting vocational education into the business of being a business—which many people would find objectionable. It has been tried mostly in rural communities where there are economic problems, where residents are trying to rebuild their local economies, and where people are searching for new ideas. For example, five school districts in Arkansas have tried the school-based enterprise, and there are a few in Georgia. Five school districts in North Carolina currently are looking for the right businesses for their schools. The problem is that too many of the enterprises have been service-oriented. Very few schools have gotten into production that exports goods or replaces imports. The model for such enterprises is clearly defined in a book that came out in 1977, called *Education in Rural America: A Reassessment of the Conventional Wisdom*, edited by Jonathan Sher. These are ways that generate growth. The skills and knowledge imparted and the availability to meet future labor market needs, of course, also help development.

Question: Shouldn't we define entrepreneurship education as more than just education for small business ownership?

I think that is absolutely right. We also have to think about teaching entrepreneurial skills. It is not just a matter of starting into business, it is also being able to think of new ideas even when you are working for somebody else—to be able to create new products, to improve processes. It is unrealistic to think that a high school student is going to graduate at age 18 and start a new business. Very few are going to be able to do that right away, but the skills and attitudes appropriate for entrepreneurs are also appropriate for creative and productive workers if the employer is willing to take advantage of those skills by giving the employee sufficient discretion on the job.

Question: What kind of research do we need on the connections between vocational education and economic growth?

There is not a great deal of existing research. One area with potential for research is on the impact of area vocational centers on communities that had lacked vocational education programs. This was supposed to affect economic growth. The problem is that it is hard to isolate education as a variable, but it would be interesting to conduct some case studies where communities obtained ARC funds for new area vocational centers. There still are plenty of areas where there are no such centers, which could be paired with those that do. If it made a difference, and if you could identify the impact of those new vocational education programs, that would be sufficient. This sort of research, however, is a long-term process, and I haven't seen anybody try to do that yet.

Question: As a manager, would you invest limited funds in retraining displaced workers or in upgrading and training workers for new and emerging occupations?

It certainly depends on the local economy. If you live in a North Carolina textile town, you should not expect your business to be there—at least with as many jobs as it once had. As a manager, you must be concerned with retraining people, but there is no reason why the retraining cannot be for new and emerging industries. I am not sure that you have to make distinctions between upgrading and retraining. You certainly want to prepare workers for the kinds of jobs that will be in demand in the future.

Question: What is being done to tie basic skills to vocational education?

That is interesting, because I have gotten two different messages. When I talk to people at the corporate level, they say they want to hire employees with the basic skills and they will provide the job-specific training. When I attended meetings of the task force on education and economic growth chaired by Governor Hunt, that is what the executives were saying. When I asked whether customized training is an important function of schools, it was obvious they had never heard of it. What's more, they could not even imagine why anybody would consider it as an education program. However, you get a very different picture at the local level—when you talk to people who have to actually start up a new plant—the plant managers. They want more people with job-specific skills, because their goals are shorter term and they must worry about making that plant profitable as soon as possible. It seems that the trend in the South is toward more generic vocational and basic skills; at least that is what I read in the various reports from the states. Vocational education is important but should be subordinate, at least at the high school level, to basic skills. Many states are currently considering restricting job-specific education to seniors. Tennessee, for example, was considering only three general areas at the high school level—pretechnical, drafting, and home economics. So it seems that the trend is more toward increased concern for the basics, still wanting vocational education, but in a more generic form, shifting the emphasis on job-specific skills to the postsecondary and community colleges. That of course varies from state to state.

Question: What is the role of short-term skill training and the relationship of that kind of training to economic growth?

I think short-term training is important under certain sets of circumstances, such as for retraining disadvantaged workers after a plant closing. Much of the short-term training called vocational education, however, really is not occupational. It is a form of prescreening, with some plant-specific training. It rarely provides transferable skills, most of which cannot be learned in a very short time. My opinion is that the customized training programs are not the best use of tax money. But I also recognize that as long as some states provide them and some do not, you have to have them to be competitive because businesses want them. In a competitive market, businesses can get the states to pay for this sort of pretraining.

But if the programs were not provided, companies would still hire those people and train them themselves. Where the programs help expand opportunities of local people, however, their value increases. We have disadvantaged workers who will not be able to get a job without having at least some preoccupational training, which is often provided through these programs. An equity consideration would be a rationale.

Question: What kind of employment would high school graduates get who had basic skills but only pretechnical training?

If they had good solid basic skills and also a vocational skill, they would have an advantage over those with only one or the other. But given a choice, the basic skills are more important. There are not many opportunities if you do not have the basic skills. I talked to the Alabama assistant director for economic development about 2 months ago and he said that the industries coming into the state want vocational education graduates who have some education in trigonometry so they can operate equipment. Some 1.5 percent of all vocational education students have studied trigonometry. The question is whether or not there is enough time in school to have, for example, geometry, trigonometry, and science and also provide more than just pretechnical training. I believe that employers look more favorably at youth with good basic skills and pretechnical training than those with more narrowly focused technical. But since I don't think very many youth are capable of learning a technical skill, which generally requires a solid basic education first, by the twelfth grade, it's really a moot question.

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20. It is ironic that this connection was promulgated by the U.S. Department of Commerce, yet it certainly was not the intent of Congress in supporting vocational education that federally funded programs or facilities be used to encourage relocation. In fact, the various laws forbid the use of federal funds for activities that lead to or may lead to job loss elsewhere. But this is what happened as vocational education became a more explicit economic incentive. Technically, some states do keep separate pots of money, but since federal funds for vocational education are fungible, the distinctions are meaningless.

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